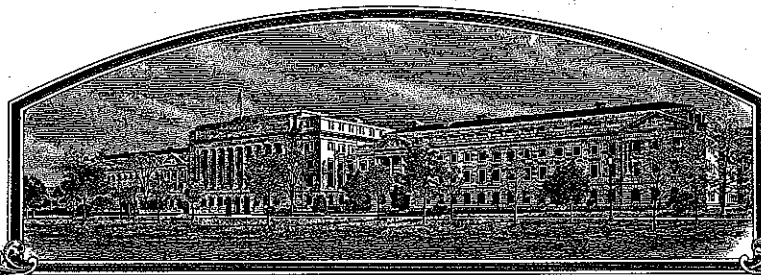


No.

200400329



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Texas Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC SUBMISSION OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE FOREGOING PURPOSES, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

PEPPER

'TAM Mild Habanero'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this twenty-fifth day of January, in the year two thousand and seven.

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture



U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER Texas Agricultural Experiment Station		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME 466-54-36		3. VARIETY NAME TAM Mild Habanero	
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) Dr. Mark A. Hussey Associate Director, Texas Agricultural Experiment Station 2147 TAMU College Station, TX 77843-2147		5. TELEPHONE (include area code) (979) 845-4747		FOR OFFICIAL USE ONLY PVPO NUMBER 2004 00 329 FILING DATE Sept. 30, 2004	
		6. FAX (include area code) (979) 458-4765			
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) State of Texas Research Agency		8. IF INCORPORATED, GIVE STATE OF INCORPORATION		9. DATE OF INCORPORATION	
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) Janie Hurley Technology Licensing Manager, Agriculture/Life Sciences Technology Licensing Office The Texas A&M University System 3369 TAMU College Station, TX 77843-3369				FILING AND EXAMINATION FEES: \$ 3652.00 DATE 9/30/04 CERTIFICATION FEE: \$ 768.00 DATE 12/21/06	
11. TELEPHONE (include area code) (979) 847-8682		12. FAX (include area code) (979) 845-1402		13. E-MAIL jhurley@tamu.edu	
14. CROP KIND (Common Name) Pepper		16. FAMILY NAME (Botanical) Solanaceae		18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (OPTIONAL) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION.	
15. GENUS AND SPECIES NAME OF CROP Capsicum chinense		17. IS THE VARIETY A FIRST GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			
19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)				20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act) <input type="checkbox"/> YES (If "yes", answer items 21 and 22 below) <input checked="" type="checkbox"/> NO (If "no", go to item 23)	
a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$3,652), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)				21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, WHICH CLASSES? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED	
23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)				22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS. <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED (If additional explanation is necessary, please use the space indicated on the reverse.)	
24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)					
25. The owners declare that a viable sample of basic seed of the variety has been furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.					
SIGNATURE OF OWNER  NAME (Please print or type) Mark A. Hussey			SIGNATURE OF OWNER NAME (Please print or type)		
CAPACITY OR TITLE Associate Director, TAES		DATE 9-21-2004		CAPACITY OR TITLE DATE	

(See reverse for instructions and information collection burden statement)

INSTRUCTIONS

GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), **ALL** of the following items must be **received** in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to **reproduce** the variety, or for tuber reproduced varieties verification that a viable (*in the sense that it will reproduce an entire plant*) tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for \$3,652 (\$432 filing fee and \$3,220 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice.) Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfilled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of \$432 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office

Telephone: (301) 504-5518

FAX: (301) 504-5291

Homepage: <http://www.ams.usda.gov/science/pvpo/pvp.htm>

ITEM

- 18a. Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
(2) the details of subsequent stages of selection and multiplication;
(3) evidence of uniformity and stability; and
(4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 18b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
(1) identify these varieties and state all differences objectively;
(2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
(3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.
- 18c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 18d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 18e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
19. If "Yes" is specified (*seed of this variety be sold by variety name only, as a class of certified seed*), the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
22. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
23. See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.

21. CONTINUED FROM FRONT (Please provide a statement as to the limitation and sequence of generations that may be certified.)

22. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

23. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. There is no charge for filing a change of address. The fee for filing a change of ownership or assignment or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority. For example, for agricultural and vegetable crops, contact: Seed Branch, AMS, USDA, Room 213, Building 306, Beltsville Agricultural Research Center--East, Beltsville, MD 20705. Telephone: (301) 504-8089. <http://www.ams.usda.gov/lsg/seed.htm>

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 3.0 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, sexual orientation, marital or family status, political beliefs, parental status, or protected genetic information. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call 202-720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

ST-470 (02-10-2003) designed by the Plant Variety Protection Office with Word 2000. Replaces former versions of ST-470, which are obsolete.

Exhibit A (Revised)**Origin and Breeding History of 'TAM Mild Habanero'**

'TAM Mild Habanero' (experimental designation 466-54-36) is a pepper (*Capsicum chinense*) cultivar with low pungency, unlike the traditional Habanero pepper. In September of 1999, an initial cross was made between a non-pungent selection of *C. chinense* out of PI 543188 and a highly pungent, Orange Habanero pepper, commercially available from Peto Seeds (now Seminis). The plant introduction, PI 543188, is a medium sized (50) cm plant with savoy leaves and small (1 cm x 2 cm), yellow, non-pungent fruit. The Orange Habanero possesses larger, smoother leaves and larger (3 cm x 4 cm), orange fruit of extremely high pungency. F₁ plants of the cross were allowed to self-pollinate in the greenhouse to produce the F₂ generation during April of 2000. This F₂ population was evaluated in the field at Weslaco under commercial practices of drip irrigation and chemical pest control during November of 2000. A single plant selection with high yield and no detectable pungency was selected as a pollen parent to backcross to Orange Habanero in the greenhouse during December of 2000. Plants of this BC₁ were established in a field plot and allowed to sib and self-pollinate during March of 2001. This bulk seed was planted again in the field and self-pollinated seed of eight single plant selections with extremely low-pungency were collected during November of 2001. These lines were again planted in the field during March of 2002, and one line, 466-54, was selected for its uniformity, high yield, earliness and large, highly aromatic fruits. The three best plants from this line were moved to the greenhouse and self-pollinated by hand during June of 2002. The seed was planted in field isolation plots during August of 2002 and the line 466-54-36 was chosen as the best. This line was subsequently planted in field isolation plots for an additional three generations to collect yield and quality data until the Spring of 2004.

'TAM Mild Habanero' has been observed for 3 generations during reproduction and increase, and was found to be uniform and stable in its described traits (see Exhibit C). No variants were observed.

Exhibit B (Revised)

Statement of Distinctness for 'TAM Mild Habanero'

'TAM Mild Habanero' pepper is most similar to the Orange Habanero, however, 'TAM Mild Habanero' differs from Orange Habanero in (i) fruit color – 'TAM Mild Habanero' is yellow-orange (L=60.5, C=58.1, H=82.8) whereas Orange Habanero is deep orange (L=57.6, C=54.2, H=65.3); (ii) lower total capsaicin concentration – 'TAM Mild Habanero' averaged 154 $\mu\text{g}\cdot\text{g}^{-1}$, compared to 12704 $\mu\text{g}\cdot\text{g}^{-1}$ for the Orange Habanero; (iii) higher beta-carotene levels – 'TAM Mild Habanero' had beta-carotene level of 7.6 $\mu\text{g}\cdot\text{g}^{-1}$, while those of Orange Habanero had no detectable beta-carotene; and (iv) earlier maturity – 'TAM Mild Habanero' fruit matured 8-14 days earlier than Orange Habanero fruit. Additional supporting performance data is provided below from two locations, Uvalde and Weslaco, Texas (Tables 1 and 2).

Performance

The fruit of 'TAM Mild Habanero' is very similar in size and shape to the recurrent parent. The shape, aroma and flavor of 'TAM Mild Habanero' are extremely similar to the hot parent. Habanero transplants were set out in the field using a RCB design with three replications on March 10, 2003 at Weslaco and on March 25 at Uvalde (Tables 1 and 2). Subsurface drip irrigation was utilized. Fruit size of 'TAM Mild Habanero' was not significantly different than that of Orange Habanero at either location. As expected, total capsaicin content was significantly higher for Orange Habanero at both locations. Fruit of 'TAM Mild Habanero' matured 8-14 days earlier than those of Orange Habanero at both locations, a commercially important trait for Fall production.

Table 1. Comparison of fruit quality Traits and yield among Three Habanero Varieties grown at Weslaco, 2003 (sample size: 5 plants/variety).

Trait	Orange Hab	TAM Mild Hab	TAM Hab VR
Fruit Size g	12.4a ^y (± 0.70)	13.1a (± 0.80)	11.2b (± 0.50)
Total Capsaicin($\mu\text{g}\cdot\text{g}^{-1}$)	12,704a (± 122)	154c (± 27)	10,520b (± 89)
Fruit Color ^x	Orange ^x - L=57.6, C=54.2, H=65.3; {Munsell- Hue= 5.63YR, Value= 5.59, Chroma= 9.1}	Yellow ^x - L=60.5, C=58.1, H=82.8; {Munsell- Hue= 1.63Y, Value= 5.88, Chroma= 8.64}	Dark Orange ^x - L=57.9, C=63.6, H=53.6; {Munsell- Hue= 1.72YR, Value= 5.62, Chroma= 11.54}
Beta-Carotene	None detected	7.6 $\mu\text{g}\cdot\text{g}^{-1}$	----
Yield kg $\cdot\text{ha}^{-1}$	8,607b (± 87)	10,691a (± 101)	8,454b (± 92)
Days to Maturity ^z	100	86	90

^zBased on 6 week old transplants

^yMean separations within rows by LSD, $P \leq 0.05$. Means followed by the same letter are not significantly different. Averages based on 3 reps with 2 fruits per rep, standard deviation in parentheses.

^xL= lightness (+100= white, -100= black), C= chroma (intensity) and h= hue angle (0° = red-purple, 90° = yellow, 180° = bluish-green, 270° = blue); Minolta CR200 chromameter.

Table 2. Comparison of Fruit Quality and Yield among Three Habanero Varieties grown at Uvalde, 2003 (sample size: 5 plants/variety).

Trait	Orange Hab	TAM Mild Hab	TAM Hab VR
Fruit Size (g)	7.5a ^y (±0.4)	7.4a (±0.5)	6.8b (±0.3)
Total Capsaicin (µg·g ⁻¹)	14,096a (±108)	192b (±20)	6,486c (±68)
Fruit Color ^x	Orange ^x - L=57.6, C=54.2, H=65.3; {Munsell- H= 5.63YR, V= 5.59, C= 9.11}	Yellow ^x - L=60.5, C=58.1, H=82.8; {Munsell- H= 1.63Y, V= 5.88, C= 8.64}	Orange ^x -L=57.9, C=63.6, H=53.6; {Munsell-H =1.71YR, V= 5.62, C= 11.55}
Beta-Carotene	None detected	7.6 µg·g ⁻¹	----
Yield (kg·ha ⁻¹)	10,258b (±79)	16,299a (±86)	---
Days to Maturity ^z	106	96	100

^zBased on 6 week old transplants

^yMean separations within rows by LSD, P≤0.05. Means followed by the same letter are not significantly different. Standard deviations in parentheses.

^xL= lightness (+100= white, -100= black), C= chroma (intensity) and h= hue angle (0° = red-purple, 90° = yellow, 180° = bluish-green, 270° = blue); Minolta CR200 chromameter.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 1.5 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

**U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705**

Exhibit C

OBJECTIVE DESCRIPTION OF VARIETY
Pepper (Capsicum spp.)

NAME OF APPLICANT (S) Texas Agricultural Experiment Station	TEMPORARY OR EXPERIMENTAL DESIGNATION TAES 466-54-36	VARIETY NAME TAM Mild Habanero
ADDRESS (Street and No. or RD No., City, State, Zip Code, and Country) Office of the Director, TAES 2147 TAMU College Station, TX 77843-2147		FOR OFFICIAL USE ONLY PVPO NUMBER 200400329

In the spaces on the left, enter the appropriate numbers that describe the characteristics of the application variety. On the right, enter the appropriate numbers that describe the characteristics of the most similar comparison variety. Right justify whole numbers by adding leading zeros if necessary. The variety that you choose for comparison should be the most similar one in terms of overall morphology, background and maturity. The comparison variety should be grown in field trials with the application variety for 2-3 location/years (environments) in the region and season of best adaptability. At least one year of trials should be conducted within the United States of America. In general, measurements of quantitative traits should be taken from one trial on 15-25 randomly selected plants or plant parts to obtain averages and statistics that describe a typical field of the variety. (Form technical content last updated Jan. 2003.)

Application Variety		Comparison Variety	
1. SPECIES : Location and Dates of Test <u>Weslaco, Texas, June 2003</u> <u>4</u> 1 = C. annuum 2 = C. frutescens 3 = C. baccatum 4 = C. chinense 5 = Other (specify) _____		Comparison Variety Name <u>Orange Habanero</u> Comparison Variety Source <u>Peto Seed</u> <u>4</u> Species (Specify if choice is 5 _____)	
2. MATURITY (In Region of Best Adaptability) : <u>7</u> <u>5</u> Days from transplanting until mature green stage <u>8</u> <u>6</u> Days from transplanting until mature red or yellow stage _____ Days from direct seeding until mature green stage _____ Days from direct seeding until mature red or yellow stage		<u>8</u> <u>8</u> Days from transplanting until mature green stage <u>1</u> <u>0</u> <u>0</u> Days from transplanting until mature red or yellow stage _____ Days from direct seeding until mature green stage _____ Days from direct seeding until mature red or yellow stage	
3. PLANT : <u>2</u> Plant Habit : 1=Compact 2=Semi-spreading 3=Spreading 4=Other _____ <u>2</u> Plant Attitude : 1=Erect 2=Semi-erect 3=Prostrate 4=Other _____ <u>6</u> <u>0</u> <u>0</u> cm Plant Height <u>5</u> <u>0</u> <u>0</u> cm Plant Width <u>1</u> <u>5</u> <u>0</u> cm Length of Stem from Cotyledons to First Flower <u>3</u> <u>5</u> <u>6</u> mm Length of Third Internode (from soil surface) <u>3</u> Basal Branches: 1=None 2=Few (2-3) 3=Many (more than 3) <u>1</u> Branch Flexibility: 1=Willowy (Cayenne Long Red) 2=Rigid (Yolo Wonder L.) <u>2</u> Stem Strength (Breakage Resistance): 1=Weak 2=Intermediate 3=Strong		<u>2</u> Plant Habit (specify if choice is 4 _____) <u>2</u> Plant Attitude (specify if choice is 4 _____) <u>6</u> <u>2</u> <u>0</u> cm Plant Height <u>5</u> <u>0</u> <u>0</u> cm Plant Width <u>1</u> <u>5</u> <u>0</u> cm Length of Stem Cotyledons to First Flower <u>3</u> <u>4</u> <u>0</u> mm Length of Third Internode (from soil surface) <u>3</u> Basal Branches <u>1</u> Branch Flexibility <u>2</u> Stem Strength (Breakage Resistance)	
Application Variety		Comparison Variety	

200400329

Application Variety

Comparison Variety

4. LEAVES :

4 6 0 mm Leaf Width
 8 0 0 mm Leaf Length
 1 7 0 mm Petiole Length



2 Mature Leaf Shape: 1=Lanceolate 2=Elliptic
 2 Leaf Color: 1=Light Green 2=Medium Green 3=Dark Green 4=Purple
 5=Other (specify) _____

Color Chart Name Munsell Code H=6.4 GY, V=4.0, C=5.2

1 Leaf and Stem Pubescence: 1=Absent (Yolo Wonder L) 2=Light
 3=Moderate (Serrano) 4=Heavy (Chili Piquin)

3 Margin Undulation: 1=Absent 2=V. Weak 3=Weak 4=Medium 5=Strong 6=V. Strong

3 Blistering: 1=Absent 2=Very Weak 3=Weak 4=Medium 5=Strong 6=Very Strong

5 9 0 mm Leaf Width
 9 0 0 mm Leaf Length
 1 8 0 mm Petiole Length

2 Mature Leaf Shape
 2 Leaf Color (Specify if choice is 5 _____)

Code H= 6.6 GY, V= 3.9, C= 5.1

1 Leaf and Stem Pubescence

4 Margin Undulation

4 Blistering

5. FLOWERS :

3 Number of Flowers per Leaf Axil

5 Number of Calyx Lobes

5 Number of Petals

4 1 mm Flower Diameter

1 Corolla Color: 1=White 2=Purple 3=Other (Specify) _____

3 Corolla Throat Markings: 1=Yellow (Tan) 2=Purple 3=Other (Specify) none

2 Anther Color: 1=Yellow 2=Purple 3=Other (Specify) _____

2 Style Length: 1=Less Than Stamen 2=Same as Stamen 3=Exceeds Stamen

1 Self-Incompatibility: 1=Absent 2=Present

3 Number of Flowers per Leaf Axil

5 Number of Calyx Lobes

5 Number of Petals

4 0 mm Flower Diameter

1 Corolla Color (Specify if choice is 3 _____)

3 Corolla Throat Markings (Specify if choice is 3 none)

2 Anther Color (Specify if choice is 3 _____)

2 Style Length

1 Self Incompatibility

6. FRUIT :

1 3 Group: 1=Bell (Yolo Wonder L) 8=Small Hot (Serrano)
 2=Pimiento (Pimiento Perfection) 9=Cherry (Sweet Cherry)
 3=Ancho (Mexican Chili) 10=Short Wax (Floral Gem)
 4=Anaheim Chili (Sandia) 11=Long Wax (Sweet Banana)
 5=Cayenne (Cayenne Long Red) 12=Tabasco (Tabasco)
 6=Cuban (Cubanelle) 13=Habanero (Scotch Bonnet)
 7=Jalapeno (Jalapeno) 14=Other _____

2 Immature Fruit Color: 1=Light Green (Cubanelle) 5=Yellow (Yellow Belle)
 2=Medium Green (Long Thin Cayenne) 6=Purple (Violetta)
 3=Dark Green (Yolo Wonder L) 7=Ivory (Twiggy)
 4=Very Dark Green (Ancho Chili) 8=Other _____

Color Chart Name Munsell Code H= 5.6 GY, V= 4.9, C= 5.6

3 Mature Fruit Color: 1=Red (Yolo Wonder L) 5=Ivory
 2=Orange 6=Green (Permagreen)
 3=Orange-Yellow (Golden Calwonder) 7=Salmon
 4=Brown (Mulatto) 8=Lemon Yellow
 9=Other _____

Color Chart Name Munsell Code H= 1.63 Y, V= 5.88, C= 8.64

2 Pungency: 1=Sweet (Yolo Wonder L) 2=Hot (Jalapeno)

1 5 mg Capsaicin per gram dry fruit

2 3 1 0 Scoville Units (dry fruit)

3 Flavor: 1=Mild Pepper Flavor 2=Moderate Pepper Flavor
 3=Strong Pepper Flavor 4=Other _____

2 Fruit Glossiness: 1=Dull 2=Moderate 3=Shiny

2 Surface Smoothness: 1=Smooth (Yolo Wonder L) 2=Rough (Long Thin Cayenne)

3 Fruit Position: 1=Upright (Santaka) 2=Horizontal 3=Pendent (Jalapeno)

2 Calyx Shape: 1=Cup-shaped (Enveloping Fruit Base) 2=Saucer-shaped (Flat, Non-Enveloping)



Saucer-shape Cupped

1 3 Fruit Group (Specify if choice is 14 _____)

3 Immature Fruit Color (Specify if choice is 8 _____)

Code H= 5.2 GY, V= 3.8, C= 5.5

2 Mature Fruit Color (Specify if choice is 9 _____)

Code H= 5.63 YR, V= 5.59, C= 9.1

2 Pungency

1 2 7 mg Capsaicin per gram dry fruit

1 9 0 5 6 0 Scoville Units (dry fruit)

3 Flavor (Specify if choice is 4 _____)

2 Fruit Glossiness

2 Surface Smoothness

3 Fruit Position

2 Calyx Shape

Application Variety Data

Comparison Variety Data

200400329

Application Variety Data

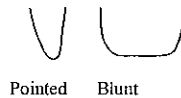
6. FRUIT (continued):

1 4 5 mm Calyx Diameter
 5 1 0 mm Fruit Length
 1 4 0 mm Fruit Diameter at Calyx Attachment
 3 0 2 mm Fruit Diameter at Mid-point
 1 6 mm Flesh Thickness at Mid-point
 3 9 0 Average Number of Fruits per Plant
 3 8 5 % Large Fruits (Weight Range: 10.2 to 13.1)
 4 1 0 % Medium Fruits (Weight Range: 5.2 to 5.6)
 2 0 5 % Small Fruits (Weight Range: 4.0 to 4.9)
 1 3 1 gm Average Fruit Weight

Cupped Rounded



2 Fruit Base Shape: 1=Cupped (Yolo Wonder L)
 2=Rounded (Jalapeno)



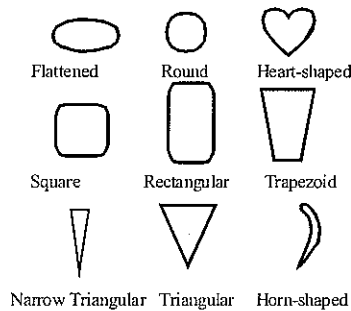
Pointed Blunt

1 Fruit Apex Shape: 1=Pointed (Long Thin Cayenne)
 2=Blunt (Yolo Wonder L)

7 Fruit Shape: 1=Bell (Yolo Wonder L)
 3=Elongate (Long Thin Cayenne)
 5=Oblate (Sunnybrook)

2=Conical (Pimiento)
 4=Oblong (Jalapeno)
 6=Globe (Red Cherry)
 7=Other lantern

8 Fruit Shape (Longitudinal Section, see attached pictures):
 1=Flattened 2=Round
 5=Rectangular 6=Trapezoid
 9=Horn-shaped



2 Fruit Shape (Cross Section, at Level of Placenta): 1=Elliptic 2=Triangular 3=Quadrangular 4=Circular

1 Fruit Set: 1=Scattered 2=Concentrated

4 Interlocutory Grooves: 1=Absent 2=Very Shallow 3=Shallow 4=Medium 5=Deep 6=Very Deep

0 % Fruits with one locule
 2 0 % Fruits with two locules
 96 0 % Fruits with three locules
 2 0 % Fruits with four locules
 0 % Fruits with five or more locules

3 0 Average Number of Locules

5 9 0 mm Pedicel Length

2 0 mm Pedicel Thickness

2 Pedicel Shape: 1=Straight 2=Curved

1 Pedicel Cavity: 1=Absent 2=Present

mm Depth of Pedicel Cavity

Comparison Variety Data

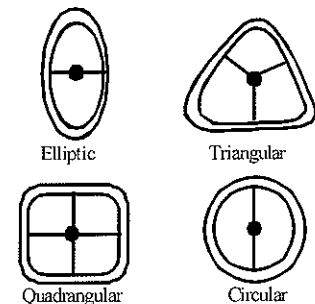
8 5 mm Calyx Diameter
 4 5 0 mm Fruit Length
 1 2 0 mm Fruit Diameter at Calyx Attachment
 2 7 5 mm Fruit Diameter at Mid-point
 1 mm Flesh Thickness at Mid-point
 4 0 0 Average Number of Fruits per Plant
 4 0 0 % Large Fruits (Weight Range 10.2 to 12.4)
 4 0 0 % Medium Fruits (Weight Range 5.6 to 6.2)
 2 0 0 % Small Fruits (Weight Range 4.5 to 5.1)
 1 2 4 gm Average Fruit Weight

2 Fruit Base Shape

1 Fruit Apex Shape

7 Fruit Shape (Specify if choice is 7 lantern)

8 Fruit Shape (Longitudinal Section)



2 Fruit Shape (Cross Section)

1 Fruit Set

4 Interlocutory Grooves

0 % Fruits with one Locule

5 0 % Fruits with two Locules

9 2 0 % Fruits with three locules

3 0 % Fruits with four locules

0 % Fruits with five or more locules

3 0 Average Number of Locules

3 4 0 mm Pedicel Length

3 0 mm Pedicel Thickness

2 Pedicel Shape

1 Pedicel Cavity

mm Depth of Pedicel Cavity

Application Variety Data

Comparison Variety Data

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Application Variety Data

Comparison Variety Data

7. SEED :

3 9 0 mm Seed Cavity Length
2 4 0 mm Seed Cavity Diameter
4 3 0 mm Placenta Length
6 8 Number of Seeds per Fruit
4 0 gm per 1000 Seeds
1 Seed Color: 1=Yellow 2=Purple

3 7 5 mm Seed Cavity Length
1 7 5 mm Seed Cavity Diameter
3 9 5 mm Placenta Length
7 5 Number of Seeds per Fruit
3 9 gm per 1000 Seeds
1 Seed Color

8. ANTHOCYANIN (1 = Absent; 2 = Weak; 3 = Moderate; 4 = Strong) :

2 Seedling Hypocotyl
1 Stem
1 Node
1 Leaf
1 Pedicel
1 Calyx
1 Fruit

2 Hypocotyl
1 Stem
1 Node
1 Leaf
1 Pedicel
1 Calyx
1 Fruit

9. DISEASE RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant); leave blank if not tested; indicate Race or Strain, when known) :

A. Viruses:

3 Cucumber Mosaic Virus
 Curly Top Virus
2 Pepper Mottle Virus
 Potato Y Virus
5 Tobacco Etch Virus
7 Tobacco Mosaic Virus

3 Cucumber Mosaic Virus
 Curly Top Virus
2 Pepper Mottle Virus
 Potato Y Virus
5 Tobacco Etch Virus
7 Tobacco Mosaic Virus

B. Other Diseases and Insects:

 Anthracnose (*Gloeosporium piperatum*)
7 Bacterial Spot (*Xanthomonas vesicatoria*)
 Cercospora Leaf Spot (*Cercospora capsici*)
 Nematode (*Meloidogyne incognita acrita*)
5 Phytophthora Root Rot (*Phytophthora capsici*)
6 Ripe Rot (*Vermicularia capsici*)
 Southern Blight (*Sclerotium rolfsii*)
 Verticillium Wilt (*Verticillium dahliae*)
8 Other (Specify) Powdery Mildew

 Anthracnose
7 Bacterial Spot
 Cercospora Leaf Spot
 Nematode
5 Phytophthora Root Rot
6 Ripe Rot
 Southern Blight
 Verticillium Wilt
8 Other (Specify) Powdery Mildew

10. COMMENTS (eg. maturity comparisons with other varieties, source of comparison variety seed, etc. Continue in Exhibit D):

The comparison variety here is Orange Habanero from Seminis Seeds

Exhibit D

Additional Description for 'TAM Mild Habanero'

Performance

Habanero transplants were set out in the field using a RCB design on March 10, 2003 at Weslaco and on March 25 at Uvalde. Subsurface drip irrigation was utilized. Plants of 'TAM Mild Habanero' at Weslaco produced significantly higher yields ($10.6 \text{ Mg}\cdot\text{ha}^{-1}$) than Orange Habanero ($8.6 \text{ Mg}\cdot\text{ha}^{-1}$) based on eight plant averages from three replications (Table 1). The same trend was observed at Uvalde, with an even greater difference in yield advantage for 'TAM Mild Habanero' (Table 2). At both locations, 'TAM Mild Habanero' produced a more concentrated fruit set, leading to a larger first harvest than for either 'TAM Habanero VR' or Orange Habanero. This might make it more amenable to mechanical harvest.

Table 1. Comparison of fruit quality Traits and yield among Three Habanero Varieties grown at Weslaco, 2003 (sample size: 5 plants/variety).

Trait	Orange Hab	TAM Mild Hab	TAM Hab VR
Fruit Size g	12.4a ^y (± 0.70)	13.1a (± 0.80)	11.2b (± 0.50)
Total Capsaicin($\mu\text{g}\cdot\text{g}^{-1}$)	12,704a (± 122)	154c (± 27)	10,520b (± 89)
Fruit Color ^x	Orange ^x - L=57.6, C=54.2, H=65.3;	Yellow ^x - L=60.5, C=58.1, H=82.8;	Dark Orange ^x -L=57.9, C=63.6, H=53.6;
Beta-Carotene	None detected	7.6 $\mu\text{g}\cdot\text{g}^{-1}$	----
Yield $\text{kg}\cdot\text{ha}^{-1}$	8,607b (± 87)	10,691a (± 101)	8,454b (± 92)
Days to Maturity ^z	100	86	90

^zBased on 6 week old transplants

^yMean separations within rows by LSD, $P \leq 0.05$. Means followed by the same letter are not significantly different. Averages based on 3 reps with 2 fruits per rep, standard deviation in parentheses.

^xL= lightness (+100= white, -100= black), C= chroma (intensity) and h= hue angle (0° = red-purple, 90° = yellow, 180° = bluish-green, 270° = blue); Minolta CR200 chromameter.

Table 2. Comparison of Fruit Quality and Yield among Three Habanero Varieties grown at Uvalde, 2003 (sample size: 5 plants/variety).

Trait	Orange Hab	TAM Mild Hab	TAM Hab VR
Fruit Size (g)	7.5a	7.4a	6.8b
Total Capsaicin($\mu\text{g}\cdot\text{g}^{-1}$)	14,096a	192b	6,486c
Fruit Color ^x	Orange- L=57.6, C=54.2, H=65.3	Yellow- L=60.5, C=58.1, H=82.8	Dark Orange- L=57.9, C=63.6, H=53.6
Beta-Carotene	None detected	7.6 $\mu\text{g}\cdot\text{g}^{-1}$	----
Yield ($\text{kg}\cdot\text{ha}^{-1}$)	10,258b	16,299a	---
Days to Maturity ^z	106	96	100

^zBased on 6 week old transplants

^yMean separations within rows by LSD, $P \leq 0.05$. Means followed by the same letter are not significantly different.

^xL= lightness (+100= white, -100= black), C= chroma (intensity) and h= hue angle (0° = red-purple, 90° = yellow, 180° = bluish-green, 270° = blue); Minolta CR200 chromameter.

Adaptation

'TAM Mild Habanero' has been successfully grown in replicated field plots at Weslaco and Uvalde, Texas, under drip irrigation. At both locations, 'TAM Mild Habanero' produced significantly higher yields than Orange Habanero (Table 2). Poor performance under deficit irrigation at Weslaco, suggests that 'TAM Mild Habanero' is not well suited to drought conditions or water stress. 'TAM Mild Habanero' should not be planted in areas adjacent to virus infested fields of any TEV or TSWV hosts. Insecticides should be applied to control the aphid and thrip vectors of these viruses immediately after planting. Application of acaracides would also be prudent in areas with frequent mite infestations. Protection from strong winds with vegetative windbreaks is recommended to prevent breakage of the long Habanero stems. The more humid areas of Texas may be better suited to commercial production of 'TAM Mild Habanero,' due to the lowland tropical nature of the *Capsicum chinense* species. Fall crops at Weslaco exhibit superior fruit quality compared to Spring crops, likely due to reduced drought and heat stress and less insect pressure.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). The information is held confidential until the certificate is issued (7 U.S.C. 2426).

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

1. NAME OF APPLICANT(S) Texas Agricultural Experiment Station	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER 466-54-36	3. VARIETY NAME TAM Mild Habanero
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) Office of the Director, TAES 2147 TAMU College Station, TX 77843-2147	5. TELEPHONE (Include area code) (979) 845-4747	6. FAX (Include area code) (979) 458-4765
7. PVPO NUMBER 200400329		

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. If no, please explain.



YES



NO

9. Is the applicant (individual or company) a U.S. national or a U.S. based company? If no, give name of country.



YES



NO

10. Is the applicant the original owner?



YES



NO

If no, please answer one of the following:

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?



YES



NO

If no, give name of country

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?



YES



NO

If no, give name of country

11. Additional explanation on ownership (Trace ownership from original breeder to current owner. Use the reverse for extra space if needed):

The original breeder (that made the cross) is Dr. Kevin Crosby, a TAES employee located at TAES' facilities in Weslaco, Texas, at the time of the cross. TAES policy and handbook manual provide that all germplasm and varieties developed by its employees in the course of their duties are owned by TAES. A copy of this policy is provided for your records.

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 0.1 hour per response, including the time for reviewing the instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, sexual orientation, marital or family status, political beliefs, parental status, or protected genetic information. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

200400329

TEXAS AGRICULTURAL EXPERIMENT STATION HANDBOOK



NUMBER 1250B

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ISSUED: March 31, 1995

STANDARD PROCEDURE

MANAGEMENT AND RELEASE OF NEW PLANT MATERIALS

1.00 PURPOSE AND BACKGROUND

The purpose of this document is to outline guidelines for the management and transfer of plant materials developed by the Texas Agricultural Experiment Station (Experiment Station) recognizing diversity in agronomic, horticultural, and industrial plant programs. The terms "plant material" and "seed" are intended to be all-inclusive, including vegetatively propagated plant materials, such as sprigs, rhizomes, or buds.

The Experiment Station, as part of the Texas A&M University System (System), and in cooperation with the Texas Agricultural Extension Service (Extension), conducts research in crop breeding and genetic improvement to benefit the public and support the educational mission of Texas A&M University (TAMU), including the development and release of improved germplasm and new crop cultivars.

The Experiment Station, part of the public agricultural research system, has a broad mission to serve agriculture, particularly farmers and the general public. Farm, commodity, and trade organizations are encouraged to provide suggestions to enhance crop improvement and the distribution of new plant materials. Plant materials are considered as intellectual property and are owned and managed by the Experiment Station, under System policies.

Three basic goals are summarized in Section 2.00 to guide release decisions. General guidelines and methods are outlined in Section 3.00 for transferring plant material for private and commercial uses. The classification of plant materials and types of releases is intended to assist both the breeder and seed users in understanding some alternatives in managing releases. Partnerships, joint incentives, and sharing of research materials are encouraged.

DISTRIBUTION:

ALL HANDBOOKS

APPROVAL:

Edward A. Hiler
EDWARD A. HILER

2.00 GOALS IN PLANT MANAGEMENT AND RELEASE

Three general goals provide the basic criteria for the management of plant materials and release decisions. These goals include:

- A. Maximize Public Benefit. Plant material must be utilized by farmers and consumers to benefit the public. Plant material must be increased and managed to retain genetic purity. Variety or designated names provide identity and recognition to the originator of the improved plant materials. Commercial production and the distribution of plant releases are essential for both large and small acreage crops. Protection agreements and licensing provisions are frequently necessary to complete research and assure transfer of materials to the private sector.
- B. Assure Technology Transfer to the Private Sector. The Experiment Station serves as a primary producer and distributor of new plant materials and depends upon the private sector to increase and market seed. State and federal plant protection provisions, protected names, trademarks, and/or markers (such as biochemical identification) may be useful in transferring technology to the private sector.
- C. Recover Costs and Generate Revenue. The generation of funds through seed sales, fees, and other business terms is essential to recover some development costs and protection expenses, maintain competitive science, and enhance future crop improvement research. Financial terms and license provisions on plant materials must be realistic and consistent with the biological potentials and business environment.

3.00 GENERAL GUIDELINES AND KEY PARTICIPANTS

- A. General Guidelines are outlined below for the orderly equitable release, distribution, and protection of plant materials.

Partnerships and Cooperation. The Experiment Station is responsible for research in crop breeding and genetic enhancement and assuring the timely transfer of this work to agricultural, scientific and industrial communities. Cooperation among the faculty and between faculty and external scientific and industrial interests is essential. Private interests are increasingly providing resources for research, in return for some preferential access to plant products and new technology. The commercialization of research had been encouraged both by Legislative mandates to the Experiment Station and through actions by the Board of Regents to provide financial incentives to faculty and staff to develop products or services of commercial usefulness.

Plant Release Proposals - Early discussion with Texas Foundation Seed Service (TFSS), the Plant Review Committee (PRC), and the System Technology Licensing Office (TLO) is encouraged in planning a new release. The breeder generally assumes a lead responsibility for preparing and submitting the Release Proposal (outlined in Section 5.00). Plant material is considered to be owned and under the stewardship of the Experiment Station. If a decision is made to not release particular plant materials, then the disposition and use of that material remains the discretion of the Experiment Station.

Exchange and Distribution. Exchange of plant material for breeding and genetic research is encouraged for public institutions and private industry and may include regional testing, Extension trials, and cooperative evaluations. "Selected Plant Materials" (see Section 4.00) may be provided to private firms, public breeders, grown on private lands, or placed with a private producer for further commercial evaluation before it is formally released.

Transfer and Protection - The formal release and transfer of new plant materials will usually involve public notices of availability and may involve Requests for Proposals or expressions of interest from private firms and/or the transfer of intellectual property rights through the use of licenses and agreements. The Experiment Station, in conjunction with the Breeder and the TLO, will consider applications for the appropriate intellectual property protection such as Certificates of Plant Variety Protection, Plant Patents, or Utility Patents in facilitating the transfer and protection of new plant materials. Additionally, in some instances individual firms and/or industrial groups may enter into research or partnership agreements on intellectual property, to gain access to genetic products.

Distribution of any plant material should be documented to avoid premature release, unauthorized distribution, misunderstandings over ownership, or loss of intellectual property rights. Protection agreements during research help assure that private firms can acquire rights and marketing opportunities later and/or protect their investment in marketing new products. Material Transfer Agreements (MTAs) are to be used in providing material to private firms and public agencies for evaluation (with copies filed with Texas Foundation Seed Service and the Technology Licensing Office).

B. Roles of Key Participants

Scientific quality, summary of research, review of proposals, and technology transfer involve several individuals and groups working together. Successful plant release includes institutional flexibility to meet the needs of each crop or release. Roles of primary participants are outlined as follows:

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SUBJECT: MANAGEMENT AND RELEASE OF
NEW PLANT MATERIALS

Plant Breeders and other scientists provide the major leadership in research and the release of plant materials. Responsibilities include research planning, periodic reviews on future releases, assuring materials are adequately protected, preparation of release proposals, and suggesting ways to implement release. A team is frequently involved with a release and may involve several disciplines and recognition of co-worker contributions.

Cooperative evaluations are encouraged, particularly with Extension Specialists. The Plant Review Committee commonly looks for Extension participation on new variety releases. Breeders maintain Breeder Seed and may provide technical or advisory assistance to TFSS, TLO or commercial firms.

Department Heads and Resident Directors provide a key role in crop improvement programs by guiding coordination between disciplines, and helping assure the TFSS, TLO and others are aware of potential releases. These Administrative Heads provide a vital linkage in planning, implementation and guidance for the total crop improvement program.

Program Coordinators provide communication among the developers of plant materials, the seed industry, and crop producers on scientific progress and the transfer of new materials into crop productions. The Head of the Department of Soil and Crop Sciences and Resident Director of Research at the Texas A&M Agricultural Research and Extension Center at Beaumont serve as Program Coordinators for all field crops and turfgrass, while the Head of the Department of Horticultural Sciences serves as the Program Coordinator for fruit, vegetable, and nut crops, including emphasis on industry relationships. Activities of Program Coordinators include:

1. Effective communication among breeders, department heads, resident directors, and with industry and producer interests;
2. Development of new partnerships between the Experiment Station and industry/producer interests, plus industry relationships and liaison with industry associations;
3. Advising the Director on release and licensing issues, and interacting with the Technology Licensing Office as appropriate. The Coordinators will report to the Director of the Experiment Station in these roles.

The Texas Foundation Seed Service, located at Vernon, will be responsible for the production of foundation seed and assisting breeders in the production of breeder's seed, as requested, and/or where required by a contract or license agreement managed by the TLO. The operation is expected to be largely self-sufficient.

TFSS works with TLO, other Foundation Seed organizations, Crop Improvement Associations in other states, the Texas Department of Agriculture, USDA, and other state and federal agencies. When plant materials are licensed or managed under an agreement, TFSS works closely with the TLO.

TFSS works with a lead Extension Specialist to coordinate seed for county and regional field tests, manages the increase and distribution of foundation seed stock and handles revenues from seed sales and nonlicensed products.

The Plant Review Committee (PRC) is a standing internal committee appointed by the Director of the Experiment Station to oversee the orderly release of plant materials, provide guidance to TFSS and TLO, and to make recommendations to the Director of the Experiment Station on plant materials. Activities of the PRC include:

1. Establish technical review panels to evaluate release proposals.
2. Hold quarterly meetings to review release proposals and meet with breeders who are planning releases, and act on release proposals.
3. Provide recommendations to the TFSS, TLO and Director's Office on release proposals, cultivar names, and agreements on licensing and advise the Director of the Experiment Station on release and licensing issues. If a question arises between faculty on "proportional creativity" or royalty sharing, the PRC may make recommendations to the Experiment Station Director.

The Technology Licensing Office is involved in initial discussions and planning with breeders, unit heads, Program Coordinators, and TFSS on planned releases suitable for licensing. In conjunction with the Program Coordinators and breeders, the TLO provides leadership and initiative for the protection and management of intellectual property for new releases including the following services:

1. Management of license and royalty agreements;
2. Marketing of new selected plant materials to commercial firms;
3. Development and negotiation of license and evaluation agreements;
4. Management of intellectual property protection;
5. Advice on business strategies and intellectual property protection issues; and
6. Advises and keeps the Assistant Vice Chancellor for Administration (Agriculture) who represents the Experiment Station apprised of all services provided by the TLO in the management of new plant materials.

4.00 TYPES OF RELEASES AND PROTECTION

A. **Classes of Material** - Improved plant materials may result from genetic manipulation by plant breeding and/or molecular and cellular biology. For purposes of management and release, plant materials are classified as follows:

1. **Genetic Stocks:** Research in plant breeding, genetic and/or cellular and molecular biology may produce unique genetic characteristics or distinct genetic materials useful to other researchers. Examples include specific genetic characters, genes or gene constructs involving vectors, and promoters. An essential characteristic of genetic stocks is that they have no immediate commercial value.
2. **Germplasm:** Germplasm is commonly used to further research, with little value for increase or direct commercial use in its present form. However, some desirable characters may be immediately useful to breeders and industry in developing improved varieties in other research programs.
3. **Breeding Lines:** Breeding lines may contain useful characteristics of unique traits with apparent commercial value. Breeding lines may be increased in their present form, used for selection, or tested further before commercialization. The Experiment Station may choose to release some advanced materials as "breeding lines" rather than continue research for commercial applications as varieties or inbred lines.
4. **Selected Plant Material:** Selected plant materials may be transferred to public or private firms for cooperative research, usually under a protection agreement, for further development, feasibility studies, or commercial exploration.
5. **Commercial Varieties or Parental/Inbred Line:** These plant materials are released for direct commercialization as new varieties or production of hybrids; release depends on clear demonstration of performance or traits in several experiments over several years, locations and/or conditions.

B. Types of Releases and Transfer

Release of plant materials is based on several factors (such as crop species, means of propagation, and commercial potential). Flexibility is essential to meet specific economic, biological or industry needs. Alternatives for release and distribution of plant materials include:

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SUBJECT: MANAGEMENT AND RELEASE OF
NEW PLANT MATERIALS

1. Unrestricted Unlimited Release - An Unrestricted Unlimited Release is intended for general uses of those plant materials with undefined uses or low commercial potential, without any restrictions on research or commercialization uses. One-time fees may be requested to recover costs.
2. Restricted Release - A Restricted Release designates specific uses for plant material, with an agreement with recipients, noting restrictions, applications, and mutual interests.
3. Limited Release - A Limited Release involves specific recipients, to enable selected firms to use plant materials. Agreements may be developed with a small number of firm(s), firms selected on the basis of their proposal, and/or provide a protected position for a single firm or organization to complete research and/or assume commercial development. Limited Releases are usually managed under a license or option agreement, with financial terms and performance expectations.
4. Unreleased Transfer - Some plant materials may not be immediately released but simply provided to others for additional research or commercial feasibility studies. "Selected Plant Materials" may be managed under a Material Transfer Agreement or an Option Agreement, until specific traits and usefulness are determined and a formal release is proposed.

C. Pre-release Protection is essential to clarify ownership and transfer uses and rights to others later. Material Transfer Agreements (MTAs) and other sample documents are available from TLO. A copy of all pre-release documentation (MTA's and other documents) should be provided by the breeders to the Technology Licensing Office, Foundation Seed Service and Program Coordinators.

Exchange of plant materials for research uses with other public breeders may be handled directly by the breeders, through an MTA with the (1) identification and quantity of materials being provided to a co-worker, (2) clarifying the anticipated uses for breeding and research purposes, (3) stating that the Experiment Station retains its ownership, and (4) obtaining written acknowledgment from the recipient.

Field testing and commercial scale evaluations are encouraged, involving other breeders, Extension Specialists, farmers or others. Most commonly seed for one season is provided for field trials and is not to be retained or transferred to others. An MTA should be completed with farms or cooperators to clarify expectations.

5.00 THE RELEASE PROPOSAL AND PROCESS

A. Release proposals are prepared by the breeders and summarize the background, current facts, and plant performance/traits. The release proposal may vary in detail, depending on the class of plant material (please see Section 4), however all release proposals should include these sections:

1. Background - information on the source, origin, or breeding history.
2. Performance and Traits - summary of key features, data, anticipated usefulness, and/or disclosure limitations or unknown features. This section may be brief for germplasm and more detailed for a variety (including details on yields, statistics, quality, host plant resistance, and regions of adaptation).
3. Seed production and availability - type and quantity of seed availability for increase or distribution.
4. Implementation - breeder's suggestion on notifications, release and distribution, and guidance for outreach (including protection as appropriate) and revenue sharing (for royalties, if others were involved in the creative development).

The Release Proposal should be prepared for internal review with sufficient data and information for a peer group to evaluate merits and make decisions. Alternatively, the Release Proposal may be prepared (or later converted) as a Station publication, to document research and provide technical information for others.

B. Registration Article (for submission to a professional journal) should be with the proposal for a new variety or germplasm release. Include a draft of the Experiment Station Leaflet for new varieties. The original and 15 copies of the entire package Release proposal, Registration Article, and Leaflet (as appropriate) should be submitted through the administrative head and Program Coordinator to the PRC (with one copy to the Foundation Seed Office) eight weeks before the quarterly PRC meetings. Additional information on preparing and submitting releases is available from the PRC Chair.

C. Revenue Distribution

Royalties or income generated from the commercialization of plant materials will be distributed to the inventors on all types of plant material, according to the TAMU System policy on intellectual property (System Policy 17.02, Patents). Scientists involved in the development of plant materials that generate royalties or income under a license or option agreement must agree in advance regarding proportionate contributions and sharing of expected income prior to the distribution of such income.